

CLAIMS

What is claimed is:

1. A document scanning system, comprising:
 - a first camera for capturing an image of a document;
 - 5 a second device for gathering data regarding the first camera's field of view at the time of image capture; and
 - signal processing logic configured to analyze the data relating to the first camera's field of view and to determine whether the first camera's view of the document was obstructed.
- 10 2. The document scanning system of claim 1, wherein the second device comprises a scanning range-finding laser.
- 15 3. The document scanning system of claim 1, wherein the second device comprises a second camera and wherein the signal processing logic utilizes data from the first and the second cameras to analyze the data relating to the first camera's field of view and to determine whether the first camera's view of the document was obstructed.
4. The document scanning system of claim 1, further comprising a third device for gathering data relating to the first camera's field of view at the time of image capture, wherein the second device and the third device comprise cameras.

5. The document scanning system of claim 1, further comprising a third device for gathering data relating to the first camera's field of view at the time of image capture, wherein the second device and the third device comprise laser range finders.

6. The document scanning system of claim 1, further comprising a third device
5 for gathering data regarding the first camera's field of view at the time of image capture, wherein the second device and the third device comprise ultrasonic range finders.

7. The document scanning system of claim 1, wherein the second device comprises a camera positioned to capture an edge-view of the document.

8. The document scanning system of claim 7, wherein the signal processing
10 logic is configured to compare the data gathered by the second device with a data model corresponding to a properly positioned document, and to signal detection of an error condition if the data gathered by the second device diverge from the data model by more than a predefined amount.

9. The document scanning system of claim 1, wherein the signal processing
15 logic is configured to compare the data gathered by the second device with a data model corresponding to a properly positioned document, and to signal detection of an error condition if the data gathered by the second device diverge from the data model by more than a predefined amount.

10. A method for scanning bound documents, the method comprising the steps of:

capturing an image of a document using a camera;
collecting data regarding the region between the document surface and the
5 camera at the time of image capture;
processing the data to detect the presence of obstructions or other conditions
that may adversely affect the quality of the image captured by the camera; and
taking one or more remedial actions if such an obstruction or other condition
is detected.

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11. The method of claim 10, wherein the processing step includes comparing
the data regarding the region between the document surface and the camera with a data
model of the region corresponding to a properly positioned document, and signaling
detection of an obstruction or other condition if the data differ from the data model in a
15 predefined manner.

12. The method of claim 10, wherein the one or more remedial actions comprise
automatically repositioning the document in relation to the camera to compensate for
misalignment detected during said processing step.

13. The method of claim 10, wherein the one or more remedial actions comprise
20 re-capturing an image of the document.

14. The method of claim 10, wherein the one or more remedial actions comprise associating a flag with the image of the document, the flag identifying the image as being potentially defective.

15. The method of claim 10, wherein the processing detects an adjustment in
5 lighting in the image captured by the camera would be desirable and wherein the one or more remedial actions comprise automatically adjusting the lighting by modifying the captured image of the bound document.

16. The method of claim 10, wherein the processing detects a distortion in the image captured by the camera and wherein the one or more remedial actions comprise
10 automatically correcting the distortion by modifying the captured image of the bound document.

17. A method comprising the steps of:

positioning a bound document on a cradle, the cradle being located in the field of view of a first camera;

5 using the first camera to capture an image of the bound document;

using at least a second camera to capture an image of the bound document and a region located between the surface of the bound document and the first camera;

10 comparing the image captured by at least the second camera to image data representing a hypothetical, bound document and a region between the surface of the hypothetical, bound document and the first camera; and

making a determination regarding the quality of the image captured by the first camera, the determination being based at least in part on the results of the comparing step.

18. The method of claim 17, wherein the determination regarding the quality of the image comprises a determination that the bound document was improperly positioned, the method further comprising:

15 re-positioning the bound document on the cradle; and

using the first camera to capture a second image of the bound document.

20 19. The method of claim 17, wherein the determination regarding the quality of the image comprises a determination that an obstruction was present in the image, the method further comprising using the first camera to capture a second image of the bound document.

20. The method of claim 17, wherein the determination regarding the quality of the image comprises a determination that an adjustment in lighting would be desirable, the method further comprising automatically effecting the adjustment in lighting by modifying the captured image of the bound document.

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21. The method of claim 17, wherein the determination regarding the quality of the image comprises a determination that the image quality is defective, the method further comprising automatically associating a flag with the captured image of the document, the flag identifying the image as being potentially defective.

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22. The method of claim 17, wherein the determination regarding the quality of the image comprises a determination that the image quality is distorted, the method further comprising automatically correcting the distortion by modifying the captured image of the bound document.

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23. The method of claim 17, further comprising:
using at least a third camera to capture an image of the bound document and a region located between the surface of the bound document and the first camera; and
comparing the image captured by at least the third camera to image data
20 representing a hypothetical, bound document and a region between the surface of the hypothetical, bound document and the first camera,

wherein the determination regarding the quality of the image captured by the first camera is based at least in part on the results of the step of comparing the image captured by at least the third camera to image data representing a hypothetical, bound document and a region between the surface of the hypothetical, bound document and the 5 first camera.

24. The method of claim 17, wherein the second camera is oriented to capture an edge view of the document.

10 25. The method of claim 17, wherein the second camera is selected from the group consisting of laser range finder, scanning laser range finder, ultrasonic range finder, auto-focus range finding technology, binocular camera array, and trinocular camera array.